

In the Claims:

Please amend the claims to read as indicated below.

1. (currently amended) A method of defragmenting ~~de-fragmenting~~ file allocations on a disk comprising:

1 determining what pages should be swapped among the various allocations made  
2 by an operating system (OS), the OS's file system mapping of the OS updated to reflect  
3 the swapped pages and a history of the original state prior to any update recorded by an  
4 engine,

5 wherein the swaps performed by manipulation of the ~~engine's~~ data structures of  
6 the engine and/or actually exchanging data on the disk where OS visible data is read and  
7 written but the original state of each altered page is not directly recorded in a historic log,  
8 but instead, a record is additionally logged of the locations of the swapped data so that an  
9 image of the OS visible data can be reconstructed prior to the time of the defragmentation  
10 ~~de-fragmentation~~ by knowing what data to effectively re-swap and what OS mapping  
11 data to effectively restore.

12 2. (previously amended) A method according to claim 1, wherein the method is  
13 performed on a computer wherein a history of data is maintained such that the computer  
14 can be returned to a state of data from an earlier point in time.

15 3. (currently amended) A method of defragmenting ~~de-fragmenting~~ file  
16 allocations on a disk according to claim 1, including the step of incorporating desired  
17 close proximity information of various OS visible pages into an algorithm executed by  
18 the engine that determines what is actually swapped, in order to reasonable maintain  
19 physical close proximity of data allocated by the OS but physically re-mapped by the  
20 engine.

1           4. (previously amended) A method according to claim 3, wherein the method is  
2 performed on a computer wherein a history of data is maintained such that the computer  
3 can be returned to a state of data from an earlier point in time.

4           5. (currently amended) An apparatus comprising a machine readable medium  
5 having computer instructions embodied therein, wherein the instructions comprising:  
6           determining what pages should be swapped among the various allocations made  
7 by an operating system (OS), the OS's file system mapping of the OS updated to reflect  
8 the swapped pages and a history of the original state prior to any update recorded by an  
9 engine,

10           wherein the swaps are performed by one of manipulation of the ~~engine's~~ data  
11 structures of the engine and actually exchanging data on the disk where OS visible data is  
12 read and written, but the original state of each altered page is not directly recorded in a  
13 historic log; but instead, a record is additionally logged of the locations of the swapped  
14 data so that an image of the OS visible data can be reconstructed prior to the time of the  
15 defragmentation ~~de-fragmentation~~ by knowing what data to effectively re-swap and what  
16 OS mapping data to effectively restore.

1           6. (currently amended) An apparatus comprising a machine readable medium  
2 having computer instructions embodied therein, the instructions comprising:  
3           determining what pages should be swapped among the various allocations made  
4 by an operating system (OS), the OS's file system mapping of the OS updated to reflect  
5 the swapped pages and a history of the original state prior to any update recorded by an  
6 engine,

7           wherein the swaps are performed by one of manipulation of the ~~engine's~~ data

8 structures of the engine and actually exchanging data on the disk where OS visible data is  
9 read and written, but the original state of each altered page is not directly recorded in a  
10 historic log, but instead, a record is additionally logged of the locations of the swapped  
11 data so that an image of the OS visible data can be reconstructed prior to the time of the  
12 defragmentation ~~de-fragmentation~~ by knowing what data to effectively re-swap and what  
13 OS mapping data to effectively restore; and  
14 incorporating desired close proximity information of various OS visible pages  
15 into an algorithm executed by the engine that determines what is actually swapped, in  
16 order to reasonably maintain physical close proximity of data allocated by the OS but  
17 physically re-mapped by the engine.

1 7-8. (cancelled)

1 9. (original) A method according to claim 4, wherein the historical data is  
2 maintained by diverting writes to a different position on the disk so historical data  
3 remains in its original location.